

RECESSION OF THE *CRONQUISTIANTHUS* GROUP OF
EUPATORIUM (ASTERACEAE)

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ABSTRACT

A taxonomic treatment of the largely Andean genus *Cronquistianthus* King & H. Robins. is rendered. Because it is retained in *Eupatorium*, s.l., the following new combinations and names are made: *Eupatorium celendinense* (King & H. Robins.) B. Turner, *comb. nov.*; *E. chachapoyense* (King & H. Robins.) B. Turner, *comb. nov.*; *E. bishopii* (King & H. Robins.) B. Turner, *comb. nov.*; *E. determinatum* (B.L. Robins.) B. Turner, *comb. nov.*; *E. ferreyrii* (King & H. Robins.) B. Turner, *comb. nov.*; *E. huanucanum* B. Turner, *nom. nov.*; *E. rosei* (King & H. Robins.) B. Turner, *comb. nov.* In all, twenty species are recognized. Brief descriptions, distribution maps, and a key to the species are provided, along with complete synonymies.

KEY WORDS: Asteraceae, Eupatorieae, *Eupatorium*, *Cronquistianthus*

King & Robinson (1987) recognized 25 Andean species of Colombia, Ecuador, and Perú in their segregate genus *Cronquistianthus*, most of these having previously resided in *Eupatorium*. The group was positioned in their subtribe Crotiniinae between *Ophryosporus* Meyer (which contains about forty species) and *Steyermarkia* King & H. Robins. (with four species); it is readily distinguished from the former by its imbricate involucre and appendaged anthers, and from the latter by its broad, strap shaped stylar appendages. In reality, the *Cronquistianthus* group would appear closest to *Aristeguietia* King & H. Robins. (containing about twenty species), the latter having very similar stylar appendages, but largely distinguished from the former by its acute involucre bracts (vs. obtuse or rounded) and rather symmetrical carpodia (vs. \pm asymmetrical). Indeed, future workers, if inclined to accept at least some of the splintering of *Eupatorium* by King & Robinson, may want to combine these two segregate groups, both being essentially Andean taxa and the characters

which distinguish between them somewhat arbitrary at best. Regardless, in attempting to provide names for the various plants sent to me for identification, I have felt the need to position the various new taxa proposed by King & Robinson for *Cronquistianthus* within *Eupatorium*, s.l., until such time as more definitive data bearing upon relationships within the latter complex is forthcoming (hopefully that obtained from DNA restriction site studies, etc.).

CRONQUISTIANTHUS King & H. Robins.

King & Robinson (1987) have provided an excellent description of this segregate from *Eupatorium*, s.l., and such is not duplicated here. They also provided an exceptional illustration of the generitype, *Eupatorium niveum* H.B.K. The group has a base chromosome number of $x = 10$, much as in *Eupatorium*, s.st. Distributional maps for all of the species are presented here, these being arranged alphabetically in figures 1-4.

KEY TO SPECIES OF *CRONQUISTIANTHUS* GROUP OF
EUPATORIUM

1. Plants of Ecuador or Colombia. (2)
1. Plants of Perú southwards. (7)
 2. Leaves clearly bicolored, the lower surfaces loosely to densely white tomentose. (3)
 2. Leaves about equally green on both surfaces, if somewhat bicolored then the lower surface densely puberulent, not tomentose, clearly reticulate venose. (4)
3. Leaves with upper surfaces bullate; achenes glabrous or nearly so; northern Ecuador and adjacent Colombia. *E. niveum*
3. Leaves with upper surfaces smooth; achenes clearly hispidulous; southern Ecuador. *E. leucophyllum*
 4. Petioles mostly 4-12 mm long; involucre bracts thin, mostly 1.0-1.5 mm wide. *E. pseudoriganoides*
 4. Petioles mostly 1-4 mm long; involucre bracts thick, mostly 1.5-4.0 mm wide. (5)

5. Heads with 10-12 florets; involucre 5-6 mm high. *E. rosei*
5. Heads with 18-20 florets; involucre 6-8 mm high. *E. bullatum*
6. Leaves mostly 10-25 mm long. (7)
6. Leaves mostly 25-100 mm long. (12)
7. Blades linear to linear oblanceolate, 3-8 times as long as wide.
 *E. desmophyllum*
7. Blades ovate to elliptic, 1-3 times as long as wide. (8)
8. Leaves ashy white strigillose or tomentulose on both surfaces. .. (9)
8. Leaves variously pubescent, but not as described in the above.
 (10)
9. Blades broadly ovate to elliptic, mostly 6-10 mm wide, the petioles rather abruptly joining the blade. *E. lopez-mirandae*
9. Blades lanceolate, mostly 3-6 mm wide, the petioles grading into the blade.
 *E. ferreyrii*
10. Peduncles minutely glandular pubescent, often intermixed with nonglandular hairs; involucre 6-7 mm high. *E. determinatum*
10. Peduncles not glandular pubescent (rarely a very few glandular hairs in *E. celendinense*); involucre mostly 4-6(7) mm high. . (11)
11. Involucre mostly 4-5 mm high, the middle and outer bracts mostly 1.0-1.5 mm wide; achenes ca. 1.5-2.0 mm long. *E. celendinense*
11. Involucre mostly 6-7 mm high, the middle and outer bracts mostly 1.5-2.5 mm wide; achenes 2.5-3.5 mm long. *E. chamaedrifolium*
12. Leaves linear or linear lanceolate to linear oblanceolate, 3-10 times as long as wide. (13)
12. Leaves ovate to triangular or cordate, 1-3 times as long as wide. .
 (15)
13. Leaves mostly linear to linear oblanceolate, 2-6 mm wide, the margins usually enrolled. *E. lavendulifolium*
13. Leaves mostly ovate lanceolate to linear lanceolate, 6-20 mm wide, the margins not enrolled. (14)
14. Leaves ovate lanceolate, the apices rounded; Perú.
 *E. chachapoyense*

14. Leaves linear lanceolate, the apices acute; southcentral Perú.
 *E. volkensis*
15. Leaves hispidulous throughout beneath with erect or ascending hairs, not
 at all puberulent; petioles 1-4 mm long. *E. macbridei*
15. Leaves variously puberulent beneath, the hairs soft and often matted.
 (16)
16. Midstem leaves mostly 2.5-5.0 cm long. (17)
16. Midstem leaves mostly 5.0-10.0 cm long. (18)
17. Leaves markedly reticulate beneath with raised veins, the undersurfaces
 markedly glandular. *E. marrubifolium*
17. Leaves relatively smooth beneath, the veins not raised and markedly
 reticulate; the surfaces not or but slightly glandular, if at all.
 *E. urubambense*
18. Leaves pinnately nervate or nearly so. *E. bishopii*
18. Leaves with 3-5 principal nerves arising from the base. (19)
19. Leaves markedly bicolored, the undersurfaces densely white tomentose.
 *E. leucophyllum*
19. Leaves otherwise, the undersurfaces variously puberulent to merely ap-
 pressed pilose. (20)
20. Midstem leaves mostly 1-2 times as long as wide. (21)
20. Midstem leaves mostly 2-3 times as long as wide. . *E. glomeratum*
21. Achenes moderately hispid on both faces and ribs, the hairs 0.15-0.20
 mm long; petioles mostly 10-30 mm long. *E. callacatense*
21. Achenes sparsely hispid along the ribs, the hairs 0.05-0.10 mm long;
 petioles mostly 3-10 mm long. *E. marrubifolium*
- Eupatorium bishopii* (King & H. Robins.) B. Turner, *comb. nov.* BA-
 SIONYM: *Cronquistianthus bishopii* King & H. Robins., *Phytologia*
 54:40. 1983. TYPE: PERÚ. Amazonas: mountains behind Tingo, ca.
 7000 ft, 21 Jan 1983, *King & Bishop 9281* (HOLOTYPE: US; Isotype:
 MO!; Photoholotype: MO!).

As noted by its authors and the illustration accompanying its description, the large pinnately veined leaves with tomentose undersurfaces readily distinguish this species from all other taxa within the *Cronquistianthus* alliance.

The species is known to me only by the type collection.

Eupatorium callacatense Hieron., Bot. Jahrb. Syst. 36:468. 1905. *Cronquistianthus callacatensis* (Hieron.) King & H. Robins., Phytologia 32:284. 1975. TYPE: PERÚ. Cajamarca: Callacate, May 1879, *Jelski 670* (HOLOTYPE: B, destroyed?; Photoholotypes: F!, MO!, NY!, TEX!).

Eupatorium kalenbornianum B.L. Robins., Contr. Gray Herb. 61:8. 1920. *Cronquistianthus kalenbornianus* (B.L. Robins.) King & H. Robins., Phytologia 23:411. 1972. TYPE: PERÚ. Junín: vicinity of Oroya, 3000-3900 m, without date, *Margaret & A.S. Kalenborn 69* (HOLOTYPE: NY!; Isotype: MO!).

Suffruticose herbs or subshrubs to ca. 1 m high. Heads pale lavender or nearly white to blue, numerous in congested terminal glomerules. Leaves mostly 5-10 cm long, 2.5-5.5 cm wide; petioles 1-3 cm long; blades broadly ovate, deltoid or subcordate, puberulent beneath, the margins crenulodentate. Involucres 4-5 mm high, purplish. Florets 20-30 per head. Corollas 3.5-4.0 mm long. Achenes ca. 2 mm long, hispidulous, the pappus of ca. 30 slender white bristles 4-5 mm long.

REPRESENTATIVE SPECIMENS: PERÚ. Ancash: Collahuas, 14 Mar 1987, *Castillo C. s.n.* (F). Cajamarca: Rupe-Contumaza, ca. 2100 m, 24 May 1981, *Sagastegui A. 9805* (F); Andaloy, 1800 m, 1 May 1981, *Sagastegui A. 9737* (F); Cerro Huacari, 2400 m, 23 May 1965, *Vega 66* (F). Huánuco: Yanahuanca, ca. 3200 m, 16-22 Jun 1922, *Macbride 1175* (F); Mito, ca. 2800 m, 8-18 Apr 1923, *Macbride 3277* (F). Junín: San Rafael, ca. 2600 m, 4 Apr 1923, *Macbride 3136* (F). La Libertad: about Santiago de Chuco, ca. 2800 m, 13 Jun 1984, *Sagastegui A. 11714* (F).

I am unable to distinguish *Eupatorium kalenbornianum* B.L. Robins., the type being a small, relatively immature sprig of what appears to be *E. callacatense* Hieron. Small leaved, late flowering, forms of *E. callacatense* superficially resemble *E. celendinense* (King & H. Robins.) B. Turner, but the latter has white heads (vs. lavender or blue) and pale tawny involucral bracts (vs. purplish). Since both these taxa occur in close proximity near Cajamarca, it is possible that the occasional hybrid between these will be found.

Eupatorium celendinense (King & H. Robins.) B. Turner, *comb. nov.*
BASIONYM: *Cronquistianthus celendinensis* King & H. Robins., Phytologia 51:179. 1982. TYPE: PERÚ. Cajamarca: Celendín, ravine in hills above town, ca. 2700 m, 17 May 1964, *Hutchinson & Wright 5134* (HOLOTYPE: US; Isotypes: F!, MO!).

Suffruticose herbs or subshrubs to 1 m high. Leaves mostly 1.0-2.5 cm long, 0.6-2.0 cm wide; petioles 2-3 mm long; blades broadly ovate to triangular, somewhat bicolored, softly puberulent beneath, darker green and rugose above, the margins crenulate. Heads white, numerous in rounded terminal corymbs,

the ultimate peduncles 0.4 mm long. Involucres 4.5 mm long, pale tawny to tawny, glabrous or nearly so. Florets ca. 10 per head. Corollas ca. 3 mm long. Achenes ca. 2 mm long, sparsely hispidulous above, the pappus of about 40 bristles ca. 3 mm long.

REPRESENTATIVE SPECIMENS: PERÚ. Cajamarca: Pumarrume, ca. 2800 m, 30 Jul 1985, *Mostacero L. 995* (F, MO, NY, TEX); Conga de Urquia, ca. 2500 m, 19 May 1967, *Sagastegui A. 8426* (F).

Additional specimens are cited by King & Robinson in their original description of the species. The species occurs in close proximity to *Eupatorium callacatense* near Cajamarca and occasional hybrids may be expected. Occasional specimens have a few glandular hairs on the peduncles (e.g., *Edwin 3580*, F, NY) but otherwise clearly belong to the present taxon.

Eupatorium chachapoyense (King & H. Robins.) B. Turner, *comb. nov.*

BASIONYM: *Cronquistianthus chachapoyensis* King & H. Robins., *Phytologia* 51:180. 1982. TYPE: PERÚ. Amazonas: "debajo de Chachapoyas," 1800-1900 m, 19 May 1962, *R. Ferreyra 14440* (HOLOTYPE: US; Photoholotypes: MO!, TEX!).

Suffruticose herbs or shrublets to 2 m high. Leaves mostly 3.0-4.5 cm long, 0.6-1.2 cm wide; petioles 3-5 mm long; blades narrowly ovate, appressed pubescent to puberulent, attenuate at the base, the apices rounded. Heads numerous in broad, rather loose, terminal cymes, the ultimate peduncles 0.4 mm long. Involucres ca. 4 mm high, the bracts with rounded apices. Florets ca. 8 per head. Corollas ca. 2.5 mm long. Achenes 1.8-2.0 mm long, hispidulous, the pappus of 35-40 bristles ca. 2 mm long.

Known only from type material. The above description is abstracted, in part, from the original description. The leaves of this taxon are quite distinctive, unlike most other taxa of the *Cronquistianthus* complex.

ADDITIONAL SPECIMENS EXAMINED: PERÚ. Amazonas: 6 km E Chachapoyas, ca. 6700 ft, 12 Jan 1983, *King 9158* (MO); 8 km E Chachapoyas, ca. 6400 ft, 12 Jan 1983, *King 9164* (MO).

Eupatorium chamaedrifolium H.B.K., *Nov. Gen. & Sp.* 4:88. 1818. [ed. folio].

Cronquistianthus chamaedrifolius (H.B.K.) King & H. Robins., *Phytologia* 23:410. 1972. TYPE: PERÚ. Piura: "inter Gonzanama et Ayavaca, alt. 1050 hex," Aug 1802, *Humboldt & Bonpland 3485* (HOLOTYPE: P; Photoholotypes: F!, LL!, MO!).

Eupatorium rugosum H.B.K., *Nov. Gen. & Sp.* 4:89. 1818. [ed. folio].

(not *E. rugosum* Houtt., 1779). *Cronquistianthus rugosus* (H.B.K.) King & H. Robins., *Phytologia* 23:411. 1972. *Eupatorium bulliferum* S.F. Blake, *nom. nov.*, *Rhodora* 43:558. 1941. *Cronquistianthus bulliferus* (S.F. Blake) King & H. Robins., *Phytologia* 49:4.



Fig. 1. Distribution of *Eupatorium*

1981. TYPE: ECUADOR. Pichincha: between "Alausi: et Cerro de Sitzan, alt. 1250 hex," Jul 1802, *Humboldt & Bonpland 3227* (HOLOTYPE: P; Fragment holotype: F!; Photoisotypes: F!, MO!, NY!).

Low spreading shrubs 0.5-1.0 m high. Leaves mostly 2-3 cm long, 1.0-2.5 cm wide; petioles mostly 1-2 mm long; blades triangular to subcordate, about equally green on both surfaces, the lower surfaces usually markedly venose with raised veins, the margins crenulate. Heads pale lavender to white, numerous in rounded terminal corymbs. Involucres mostly 7-8 mm high, the bracts mostly 1.5-2.0 mm wide, glabrous or nearly so. Florets 15-20 per head. Corollas ca. 5 mm long. Achenes ca. 2.5 mm long, hispidulous, the pappus of ca. 40 bristles 4-5 mm long.

REPRESENTATIVE SPECIMENS: ECUADOR. Azuay: vicinity of Cuenca, 17-24 Sep 1918, *Rose 22919* (NY); vicinity of Cuenca and Baños, 2400-2800 m, 25 Jul 1943, *Solis 5148* (F). Cañar: N rim of the valley of the Río de Cañar, 23 Apr 1945, *Camp E-2783* (NY). Loja: Cerro Pichanga, 2900-3050 m, 6 Sep 1984, *Jaramillo 7275* (F). Pichincha: "Province of Alansi," Jul 1864, *Jameson s.n.* (NY).

PERÚ. Piura: between Huancabamba and Ayavoca, 3000 m, May 1912, *Weberbauer 6355* (F).

Eupatorium chamaedrifolium H.B.K. appears to be indistinguishable from *E. bulliferum* S.F. Blake. I originally tried to recognize both taxa but came to realize that these could not be maintained, either morphologically or geographically.

Eupatorium desmophyllum B.L. Robins., *Contr. Gray Herb. n.s. 73:9. 1924.*
Cronquistianthus desmophyllus (B.L. Robins.) King & H. Robins., *Phytologia* 23:411. 1972. TYPE: PERÚ. Junín: Chavanillo, dry banks above the Río Marañón, 2440 m, 17-26 Aug 1922, *Macbride & Featherstone 1975* (HOLOTYPE: F!; Photoholotype: NY!; Isotype: GH!; Photoisotypes: F!, MO!, NY!, TEX!).

Shrub or shrublet 20-70 cm high. Leaves linear elliptic to linear lanceolate, ashen, mostly 10-25 mm long, 1-3 mm wide, appressed sericeous on both surfaces, the margins revolute, entire or nearly so. Heads pale violet to white, 3-15 in terminal congested cymes, the ultimate peduncles 0-10 mm long. Involucres 8-10 mm high, the bracts 5-7 seriate, markedly graduate, the apices rounded. Florets 20-40 per head. Corollas ca. 5 mm long. Achenes ca. 3 mm long, sparsely hispid apically, the pappus of 40-50 bristles 4-5 mm long.

REPRESENTATIVE SPECIMENS: PERÚ. Ancash: ca. 25 km above Yungay in quebrada de Llanganuco, ca. 2800 m, 27 Jun 1966, *Edwin 3842* (F); ruins at Wilcahuamin, ca. 3400 m, 13 Jun 1986, *Warnock 5069* (TEX).

Cajamarca: Cascabamba, ca. 2600 m, 26 Jun 1983, *Sagastegui A. 10714* (F, MO). La Libertad: vicinity of Santiago de Chuco, ca. 2800 m, 13 Jun 1984, *Sagastegui A. 11737* (F, MO, NY).

Because of its ashen white linear leaves, a very distinctive species, not likely to be confused with another.

Eupatorium determinatum (B.L. Robins.) B. Turner, *comb. nov.* *Eupatorium urubambense* B.L. Robins. var. *determinatum* B.L. Robins., *Contr. Gray Herb.* n.s. 68:33. 1923. *Cronquistianthus determinatus* (B.L. Robins.) King & H. Robins., *Phytologia* 51:181. 1982. TYPE: PERÚ. Huánuco: Yanahuanca, on shrubby southern slope, ca. 3050 m, 16-22 Jun 1922, *Macbride & Featherstone 1181* (HOLOTYPE: F!; Photoholotype: NY!; Isotype: GH!).

Cronquistianthus infantesii King & H. Robins., *Phytologia* 51:181. 1982. TYPE: PERÚ. La Libertad: Sartimbamba, 5 Jul 1962, *Infantes 916* (HOLOTYPE: US; Photoholotype: MO!, TEX!).

Shrublets or shrubs 0.3 to 1.0 m high. Stems with numerous short internodes, the base of the petioles persistent. Leaves mostly 1.5-2.5 cm long, 0.8-1.2 cm wide; petioles 2-5 mm long; blades ovate, appressed puberulent, more so below, the margins crenulate. Heads sessile, bluish white to lavender, numerous in congested terminal glomerules. Florets 11-15 per head. Corollas 3-4 mm long. Achenes ca. 3 mm long, glabrous or nearly so (a few short hispid hairs near apex), the pappus of 20-30 bristles 2-5 mm long.

REPRESENTATIVE SPECIMENS: PERÚ. Ancash: Chiquian, hills east of the town, 3500-3800 m, 7 Aug 1949, *Ferreyra 6218* (F); above Llupa on road to Pitec, ca. 3500 m, 10 Jun 1986, *Warnock 5056* (TEX); ruins at Wilcahuamin, ca. 3400 m, 13 Jun 1986, *Warnock 5068* (TEX). Huánuco: Llata, ca. 2200 m, 21 Aug 1972, *Macbride 1990* (F).

The species is superficially similar to *Eupatorium chamaedrifolium* but is readily distinguished by its narrow leaves with longer petioles and peduncles with glandular hairs. I am unable to distinguish *Cronquistianthus infantesii* King & H. Robins., which has somewhat shorter pappus bristles than is typical for the species (1.5-3.0 mm long vs. 2.5-5.0 mm long).

Eupatorium ferreyrii (King & H. Robins.) B. Turner, *comb. nov.* BASIONYM: *Cronquistianthus ferreyrii* King & H. Robins., *Phytologia* 27:395. 1974. TYPE: PERÚ. Cajamarca: between Celendín and Balsas, along Río Marañón, 3000-3100 m, 7 Aug 1958, *R. Ferreyra 19293* (HOLOTYPE: US; Photoholotypes: MO!, NY!; Isotype: US).

Shrubs or shrublets to 1 m high with pale blue to blue heads. Much resembling *Eupatorium desmophyllum* B.L. Robins., but the leaves narrowly

lanceolate, clearly trinervate, the vestiture of appressed strigose, ashy white hairs.

ADDITIONAL SPECIMENS EXAMINED: PERÚ. Cajamarca: 24 km NNE of Celendín, 29 May 1966, *Edwin 3605* (F, NY); canyon of Río Marañón above Balsas, 2950 m, 21 May 1964, *Hutchinson 5247* (F, MO, TEX); Gelig, ca. 2900 m, 27 Jul 1985, *Mostacero L. 890* (F, MO, NY); La Tranca-Gelig, ca. 2800 m, 18 Aug 1984, *Sagastegui A. 12151* (F, MO, NY, TEX).

King & Robinson compared this species with *Eupatorium chamaedrifolium* but it appears closer to *E. desmophyllum*, both of these occurring in the department of Cajamarca near Celendín. According to label data, *E. desmophyllum* is rather common on hillslopes and along the roadside in this area, while *E. ferreyrii* (King & H. Robins.) B. Turner is rather uncommon and confined to rocky screes.

Eupatorium glomeratum DC., *Prodr.* 5:154. 1836. *Cronquistianthus glomeratus* (DC.) King & H. Robins., *Phytologia* 23:411. 1972. TYPE: PERÚ. without locality but probably near Lima, *Haenke 8146* (HOLOTYPE: G-DC; Photoholotypes: F!, LL!, MO!, NY!, TEX!). In the original description the type is said to be from "inter Chilenses herb. Haenkeani adnumeratur," but the type was probably collected in the mountainous areas east of Lima, Haenke having stopped over at the port of Callao, Perú in 1790 from whence he crossed the Andes.

Clambering or sprawling shrub 0.8 m high or more. Leaves mostly 6-12 cm long, 2.5-5.0 cm wide; petioles 0.8-3.0 cm long; blades thin, narrowly triangular to subcordate, 3(5) nervate from near the base, pilose-puberulous beneath, especially along the venation, the surfaces glandular atomiferous, the margins crenulate, the apices acute. Heads sessile, light blue, numerous in terminal divaricate glomerules. Involucres ca. 6 mm high, the bracts 3-4 seriate, purplish, the outer series puberulent, the inner series glabrous. Florets ca. 10 per head. Corollas 4-5 mm long, the lobes glabrous or with atomiferous amber glands. Achenes 3.5-4.0 mm long, sparsely hispidulous, the pappus of 30-40 bristles ca. 5 mm long.

ADDITIONAL SPECIMENS EXAMINED: PERÚ. Huancavelica: 8 km E of Mejorada, 2400 m, 13 Mar 1939, *Stork 10893* (F). La Libertad: Pallar-Huaguil, 3000 m, 23 Jun 1974, *Lopez M. 8121* (MO). Lima: above Obrajillo, along Río Chillón, 2800-3200 m, 13-23 Jun 1925, *Pennell 14885* (F, NY); San Buenaventura, 2700-2800 m, 17 Jun 1925, *Pennell 14552* (F, NY).

The tightly congested glomerate heads and arrowheadlike leaves readily mark this taxon.

Eupatorium huanucanum B. Turner, *nom. nov.* BASIONYM: *Cronquistianthus macbridei* King & H. Robins., *Phytologia* 51:182. 1982. (not



Fig. 2. Distribution of *Eupatorium*

Eupatorium macbridei B.L. Robins., 1923). TYPE: PERÚ. Huánuco: Huacachi, a station near Muna, open rocky ridge, ca. 6500 ft, 20 May-1 Jun 1923, *Macbride 3881* (HOLOTYPE: US; Isotype: F!).

Shrub or shrublet to 1.5 m high. Leaves 3-4 cm long, 2-3 cm wide; petioles 1-4 mm long; blades triangular to subcordate; trinervate, densely long hispidulous beneath, the veins raised reticulate, the margins crenulate. Heads numerous in congested corymbose panicles. Involucres 4-5 mm high, the bracts 3-4 seriate, markedly deciduous, pilose, the apices broadly rounded. Florets ca. 10 per head. Corollas 4-5 mm long. Achenes ca. 1 mm long, sparsely hispidulous, the pappus of 30-40 bristles 4-5 mm long.

ADDITIONAL SPECIMEN EXAMINED: PERÚ. Huánuco: Acomayo, 2100 m, 14 Apr 1946, *Woytkowski 34231* (F, MO).

This taxon might be mistaken for a large leaved form of *Eupatorium chamaedrifolium*, but the latter has fewer, larger heads with glabrous involucre bracts. It might also appear to be a small leaved form of *E. callacatense*, but the latter has leaves with smoother undersurfaces and appressed soft hairs. Its original describers compared it to *E. glomeratum* DC., the latter having longer more sagittate blades with longer petioles (8-30 mm long vs. 1-4 mm long).

Eupatorium lavandulaefolium DC., *Prodr.* 5:15. 1836. *Cronquistianthus lavandulaefolius* (DC.) King & H. Robins., *Phytologia* 23:411. 1972. TYPE: PERÚ. without locality, without date, *Dombey 51 [8147]* (LECTOTYPE [selected here]: G-DC; Photolectotypes: F!, MO!, NY!, TEX!). Two specimens were examined by DC., the other a *Haenke* collection, also from Perú; they clearly belong to the same taxon.

Eupatorium chotense Hieron., *Bot. Jahrb. Syst.* 36:466. 1905. *Cronquistianthus chotensis* (Hieron.) King & H. Robins., *Phytologia* 23:410. 1972. TYPE: PERÚ. Cajamarca: between Chota & Cutervo, Jun 1979, *Jelski 794* (HOLOTYPE: B, destroyed; Photoholotypes: F!, MO!, NY!).

Suffruticose herbs or subshrubs to 1 m high. Because of its bicolored linear lanceolate to linear leaves, which are often deflexed, an easily recognized species.

REPRESENTATIVE SPECIMENS: PERÚ. Ancash: Pachacoto to Catac, ca. 3400 m, 13 May 1976, *Lopez M. 8333* (F, MO). Cajamarca: Llama-Huambos, ca. 2280 m, 22 May 1965, *Lopez 5261* (F, MO); Las Quinuas to El Mejón, ca. 3200 m, 14 Jun 1981, *Sagastegui A. 10109* (F). Junín: ca. 18 km by air SSE of Tarma, ca. 4000 m, 27 Nov 1962, *Iltis 132* (F). La Libertad: Huacas, ca. 2800 m, 15 Jun 1984, *Sagastegui A. 11902* (F, MO). Loreto: Río Blanco, ca. 4000 m, 8-19 May 1922, *Macbride 794* (F). Piura: between

Canchaque and Huancabamba, 1900-2200 m, 17 Apr 1987, Diaz S. 2430 (MO, NY).

A variable species, especially in leaf shape and vestiture. Relatively broad leaved forms have been called *Eupatorium chotense* Hieron.

Eupatorium leucophyllum H.B.K., *Nov. Gen. & Sp.* 4:90. 1818. [ed. folio].
Cronquistianthus leucophyllus (H.B.K.) King & H. Robins., *Phytologia* 23:411. 1972. TYPE: ECUADOR. Loja: "Juxta pagos Caxanumae et Gonzanama, alt. 1080 hex," Aug 1802, *Humboldt & Bonpland s.n.* (HOLOTYPE: P; Photoholotypes: F!, LL!, MO!).

This relatively poorly collected species resembles *Eupatorium niveum* H.B.K. but is distinguished by its weakly bicolored leaves with more nearly ovate blades which taper upon the petioles, and yet other characters, as noted in the key.

ADDITIONAL COLLECTIONS EXAMINED: ECUADOR. Loja: in mountains about Loja, without date, *Hartweg s.n.* (NY); Argelia, 2230 m, 4 May 1946, *Espinosa 301* (NY); entrance to Parque Nacional *Podocarpus*, 2600 m, 30 Apr 1987, *van der Werff 9205* (MO).

The type and Hartweg collections cited above were said to be from Perú but presumably were collected in southernmost Ecuador (District of Loja). The taxon is likely also to be found in northernmost Perú.

Eupatorium lopez-mirandae Cabrera, *Bol. Soc. Argentina Bot.* 10:21. 1962.
Cronquistianthus lopez-mirandae (Cabrera) King & H. Robins. *Phytologia* 54:40. 1983. TYPE: PERÚ. La Libertad: Hacienda Cochabambo, ca. 2750 m, 26 Jun 1958, *A. Lopez & A. Sagastegui 2782* (HOLOTYPE: LP).

This taxon, what with its small ashy white foliage, is superficially similar to *Eupatorium ferreyrii* but is readily distinguished by its broader ovate leaves and smaller heads (ca. 10 vs. 15-20); in addition the pappus is quite short, ca. 1 mm long (vs. 3-5 mm long in *E. ferreyrii*). The original description is accompanied by an excellent illustration.

SPECIMENS EXAMINED: PERÚ. Cajamarca: road to Langla, ca. 2600 m, 3 Jul 1985, *Mostacero L. 3* (F); La Encanada, ca. 2600 m, 17 Aug 1973, *Sagastegui A. 7775* (F); Pullucana (Arriba de Baños del Inca), ca. 2650 m, 17 Aug 1984, *Sagastegui A. 12001* (F, MO, TEX).

So far as known, both *Eupatorium lopez-mirandae* Cabrera and *E. ferreyrii* are largely confined to the Dept. of Cajamarca, the former to areas south of Cajamarca, extending into the border regions of La Libertad (from whence the type); the latter is largely centered along the Río Marañón, along the Celendín-Balsas road, above the Río Marañón.

Eupatorium marrubifolium Hieron., Bot. Jahrb. Syst. 36:466. 1905. *Cronquistianthus marrubifolius* (Hieron.) King & H. Robins., Phytologia 27: 396. 1974. TYPE: PERÚ. Cajamarca: between Chota and Cutervo, Jun 1979, *Jelski 799* (HOLOTYPE: B, destroyed; Photoholotypes F!, MO!, NY!, TEX!).

Suffruticose herbs or shrublets 40-80 cm high. Leaves mostly 2.5-6.0 cm long, 1.3-3.0 cm wide; petioles 3-10 mm long; blades ovate to cordate, moderately to sparsely pubescent beneath with mostly soft appressed hairs (often densely so when young), the margins crenulate. Heads lavender to pale blue, numerous and mostly sessile in terminal corymbose panicles. Involucres 7-8 mm high, the bracts glabrous or nearly so, often purplish apically. Florets 10-16 per head. Corollas 4-5 mm long. Achenes ca. 2.5 mm long, pubescent with short hispid hairs mostly to 0.1 mm long, the pappus of ca. 40 bristles 4-5 mm long.

REPRESENTATIVE SPECIMENS: PERÚ. Cajamarca: arriba de San Juan, ca. 2800 m, 17 May 1976, *Sagastegui A. 8966* (F); Fila la Conga, ca. 2800 m, 6 Jul 1977, *Sagastegui A. 8976* (F); Cerro Huacaris, ca. 2600 m, 23 May 1965, *Vega 65* (F). Huánuco: Llata, ca. 2600 m, 21 Aug 1922, *Macbride 2236* (F). La Libertad: Usquil, 3000-3100 m, 9 Jun 1950, *Ferreya 7643* (F); Salpo-Chanchacap, ca. 7800 m, 24 May 1984, *Sagastegui A. 11655* (F, MO, TEX); vicinity of Santiago de Chuco, 2800 m, 13 Jun 1984, *Sagastegui A. 11766* (F, MO, NY). Lima: Canta, 2600-2800 m, 20-26 Jun 1975, *Pennell 14742* (F, MO, NY).

This taxon is closely related to *Eupatorium callacatense* but is readily distinguished from the latter by its mostly smaller thicker leaves with shorter petioles.

Eupatorium niveum H.B.K., *Nov. Gen. & Sp.* 4:90. 1818 [ed. folio]. *Cronquistianthus niveus* (H.B.K.) King & H. Robins., Phytologia 23:411. 1972. TYPE: COLOMBIA. Cauca: near Popayan, 1801, *Humboldt & Bonpland s.n.* (HOLOTYPE: P (microfiche!); Photoisotypes: F!, MO!).

Eupatorium origanoides H.B.K., *Nov. Gen. & Sp.* 4:89. 1818. [ed. folio]. *Cronquistianthus origanoides* (H.B.K.) King & H. Robins., Phytologia 23:409-412. TYPE: ECUADOR. without locality, 1802, *Humboldt & Bonpland s.n.* (PHOTOHOLOTYPE: P (microfiche!); Photoisotypes: MO!, NY!).

Cronquistianthus trianae King & H. Robins., Phytologia 56:252. 1984. TYPE: COLOMBIA. Narino: Turquerres, 3200 m, *Triana 1210* (HOLOTYPE: US!; Photoholotype: MO!).

Eupatorium niveum H.B.K. var. *setosocarpum* Gilli, Feddes Repert. Spec. Nov. Regni. Veg. 94:308. 1983. TYPE: ECUADOR. Im-



Fig. 3. Distribution of *Eupatorium*

babura: Berg bei Otavalo, 2600 m, 16 Jul 1975, A. Gilii 426 (PHOTOHOLOTYPE: MO!).

Clambering shrubs 1-2 m high. Stems cottony pubescent to glabrescent. Leaves 3-8 cm long, 2-4 cm wide; petioles 1.0-2.5 cm long; blades broadly ovate, deltoid or cordate, bicolored, trinervate, the lower surfaces densely white tomentose, the upper surfaces glabrous, rugose or subrugose, the margins evenly crenulate. Heads numerous in congested corymbose panicles. Involucres 4-5 mm high, the bracts 9-12, 2-3 seriate, graduate. Florets 8-12 per head, the corollas glabrous except for the lobes, white, ca. 3 mm long. Achenes ca. 1.5 mm long, glabrous or sparsely hispid at apices, the pappus of 30-40 bristles 2-3 mm long.

REPRESENTATIVE SPECIMENS: COLOMBIA. Narino: near Pun, high bank above Río Pun, 2895 m, 15 Aug 1935, Mezia 7623 (LL).

ECUADOR. Carchi: Las Penas, 3150 m, 22 Jan 1939, *Asplund* 7201 (NY). Imbabura: 3 km toward San José de Minas from the Otavalho-Selva Alegre road, 2900 m, 24 Jan 1984, *Grimes* 2535 (NY, TEX). Pichincha: El Pongo, 2800 m, 25 Jul 1987, *Zak* 2260 (F, MO, TEX).

To judge from collections (22 sheets from NY alone), this is a relatively common species in northern Ecuador and closely adjacent Colombia where it occurs at elevations from 2900-3000 m. King & Robinson (1972, p. 409) contended that "One species of *Cronquistianthus*, *C. organoides* (sic), has scattered hairs inside of the corolla, a feature not found in any other species of the genus, even the closely related *C. niveus*." If one plots those specimens cited by King & Robinson which reportedly contain scattered hairs in the corolla (an observation which I can confirm, but these are usually widely disposed within the throat and do not occur in all corollas) these will *mostly* cluster in Colombia and closely adjacent Ecuador, whilst collections which lack such hairs are *mostly* found in the vicinity of Quito, Ecuador (Depto. Pichincha and closely adjacent Carchi). Subsequently, King & Robinson (1984) acknowledged that their original evaluation of *C. organoides* (H.B.K.) King & H. Robins. was erroneous, and that the latter name is synonymous with *C. niveus* (H.B.K.) King & H. Robins. This decision was presumably made after examinations of type material for hairs in the corolla, although this was not stated. The holotype of *Eupatorium organoides* H.B.K. is at P; the microfiche of this specimen is difficult to assess as regards leaf shape, much less corolla hairs, but a photoisotype at NY reveals the leaves to have a leaf shape suggestive of what King & Robinson might call *Cronquistianthus trianae* King & H. Robins., thus if they maintain the latter taxon it might ultimately be again replaced with *C. organoides*. Nevertheless, they maintained that specimens with scattered hairs within the throat represented a good species and provided the name *C. trianae* for these. Other than the throat hairs (which are variable and occasionally occur in plants from about Quito, Ecuador) there appears to be little

else to distinguish between their *C. trianae* and *C. niveus*, although in general, the leaves from the more northern populations of *Eupatorium niveum* H.B.K. (as considered here) have somewhat longer, less rugose, thinner blades with mostly rounded bases (vs. blades triangular to cordate) and hairy throats appear to correlate somewhat with such leaves. Regardless, the plants concerned are so similar and the characters which mark them so variable that I have little hesitation in treating these as but members of a single variable species, although future workers may find other characters or attributes that might warrant varietal status.

Eupatorium pseudoriganoides Hieron., Bot. Jahrb. Syst. 29:10. 1900. *Cronquistianthus pseudoriganoides* (Hieron.) King & H. Robins., Phytologia 23:411. 1972. TYPE: ECUADOR. without locality, without date, Sodero 6/24 (HOLOTYPE: B, destroyed?; Photoholotypes: MO!, NY!).

Intricately branched low clambering shrubs to 3 m high. Leaves mostly 2.5-6.0 cm long, 1.0-2.5 cm wide; petioles 4-12 mm long; blades ovate to deltoid, 3(5) nervate, about equally green on both surfaces, sparsely to densely pilose puberulent beneath, the margins crenulate, the apices acute. Heads numerous, white to pale lavender, arranged in broad, mostly trichotomous assemblages, the ultimate peduncles 0-4 mm long. Involucres (4)5-6 mm high, the bracts 3-4 seriate, stramineous, puberulent, mostly 1.0-1.6 mm wide, the apices obtuse. Florets 10-15 per head. Corollas 3-4 mm long. Achenes 2.5-3.0 mm long, glabrous or nearly so, the pappus of 30-40 bristles (2)3-4 mm long.

REPRESENTATIVE SPECIMENS: ECUADOR. Azuay: Ganadel, ca. 3100 m, 23 Sep 1955, *Asplund 17731* (LL, NY); ridge between El Pan and Guachapala, ca. 2800 m, 4 Sep 1945, *Camp E-5235* (NY); ca. 15 km SW of Cuenca, ca. 3000 m, 29-30 Jun 1945, *Camp E-3956* (MO, NY); Cuenca, 15 Sep 1920, *Holway 993* (NY); ca. 17 km S of Cumbe, ca. 3000 m, 24 Jan 1976, *King 6892* (F, MO, NY). Cañar: between Biblian and Cañar, ca. 3300 m, 18 Sep 1944, *Camp E-445* (NY); near El Tambo, ca. 3300 m, 5 Jul 1945, *Camp E-3989* (F). Chimborazo: Páramo de Cacheaco, ca. 3200 m, 27 Jul 1959, *Barclay 8300* (MO).

A variable but readily distinguished species by its nonbicolored, distinctly petiolate leaves and relatively thin, narrow, involucral bracts. A collection from Azuay Province (*Jaramillo 5447*, F) is noteworthy for its relatively small heads (4-5 mm high) and short pappus (ca. 3 mm long), otherwise it is very similar to the species.

Eupatorium rosei (King & H. Robins.) B. Turner, *comb. nov.* BASIONYM: *Cronquistianthus rosei* King & H. Robins., Phytologia 51:182. 1982. TYPE: ECUADOR. Azuay: vicinity of Cuenca, 17-24 Sep 1918, *J.N. Rose, A. Pachano & G. Rose 22919* (HOLOTYPE: US).

This taxon is suspiciously close to *Eupatorium chamaedrifolium* and is said to differ from the latter in having smaller heads with fewer florets (ca. 12 vs. 18-20) and more strongly costate involucre bracts. Since *E. roseum* (King & H. Robins.) B. Turner occurs in the same area as *E. chamaedrifolium*, the latter being quite variable, it is likely that these will ultimately prove synonymous.

Eupatorium urubambense B.L. Robins., Proc. Amer. Acad. Arts 55:38. 1919.
Cronquistianthus urubambensis (B.L. Robins.) King & H. Robins., Phytologia 23:411. 1972. TYPE: PERÚ. Cusco: in the valley of Ymay [?], without date, Urubamba, *Pentland s.n.* (HOLOTYPE: K; Photoholotype: GH!; Fragment holotype: GH!).

Eupatorium urubambense B.L. Robins. var. *mantarensis* B.L. Robins., Contr. Gray Herb. 90:33. 1930. TYPE: PERÚ. Huancavelica: Mantaro Valley, near Mejorada, 2800-2900 m, 21 Mar 1926, *Weberbauer 7614* (HOLOTYPE: F!; Photoholotype: NY!; Isotype: GH).

Erect shrubs or subshrubs 0.5-3.5 m high. Leaves mostly 4-6 cm long, 1.5-2.5 cm wide; petioles 0.5-1.0 cm long; blades narrowly triangular, trinerate from the base, densely puberulent beneath, the margins crenulodentate. Heads bluish, numerous in terminal cymes, the ultimate peduncles mostly puberulent, 1-5 mm long. Involucres 5-7 mm high, the bracts 3-4 seriate, the inner series glabrous, gradually narrowed and obtuse apically. Florets 10-15 per head. Corollas ca. 5 mm long. Achenes 3-4 mm long, hispidulous, the pappus of 30-40 bristles 4-5 mm long.

REPRESENTATIVE SPECIMENS: PERÚ. Ayacucho: Ayacucho, 1951, *Soukup 4010* (F). Cusco: 13 km N of Písaq on road to Ollantaytambo, scree slope and adjacent cliffs overlooking Río Urubamba, 2900 m, 27 Apr 1977, *Gentry 19802* (F, MO); Chicon Canyon, 2800-3000 m, 7 May 1939, *Vargas (Goodspeed) 11048* (F); Quebrada de Paucartambo, 3000 m, 20 Jun 1940, *Vargas 1936* (F, MO).

Eupatorium volkensis Hieron. in Urban, Bot. Jahrb. Syst. 40:370. 1908.
Cronquistianthus volkensis (Hieron.) King & H. Robins., Phytologia 23: 411. 1972. TYPE: PERÚ. without locality, without date, *Weberbauer 4850* (HOLOTYPE: B, destroyed; Photoholotypes: F!, MO!, NY!, TEX!).

Scandent suffruticose perennial herb or shrublet to 1 m high. Leaves mostly 6-12 cm long, 0.8-2.0 cm wide; petioles 1-5 mm long; blades narrowly lanceolate to linear lanceolate, pinnately and reticulately veined beneath, moderately to densely puberulent, the margins crenulate to nearly entire. Heads blue or purplish, numerous in tight terminal cymes, the ultimate peduncles mostly 0-8 mm long. Involucres 7-8 mm high, the bracts 4-5 seriate, the inner series



Fig. 4. Distribution of *Eupatorium*

glabrous or nearly so with obtuse or rounded apices. Florets ca. 12 per head. Corollas 5-6 mm long. Achenes 3-4 mm long, glabrous to sparsely hispidulous above, the pappus of 40-50 bristles, 5-6 mm long.

REPRESENTATIVE SPECIMENS: PERÚ. Ayacucho: Huanta, 2800 m, 19-21 May 1929, *Killip 23321* (NY). Cusco: about the ruins of Sacsahuaman, 3500 m, 6 May 1983, *Beck 8353* (F); trail from Chincheros plaza to Antakillqa, 3700 m, 13 Jan 1982, *Davis, et al. 1414* (F); near San Jeremino, 3200 m, 14 Feb 1975, *Mayolo 106* (F); Sacsahuaman, above Cusco, 3500-3600 m, 24 Apr 1925, *Pennell 13542* (F); Quebrado de Juayocari - Laguna de Yanaccocha, 2900-3860 m, 20 Dec 1988, *Tupayachi 789* (MO).

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